

SIMULATION FOR PERFORMANCE OF CONTAINER OPERATIONS IN THE YARD OF WESTPORT KLANG

**A thesis submitted to the Graduate School in partial
fulfillment of the requirements for the degree
Master of Science (Information Technology),
Universiti Utara Malaysia**

by

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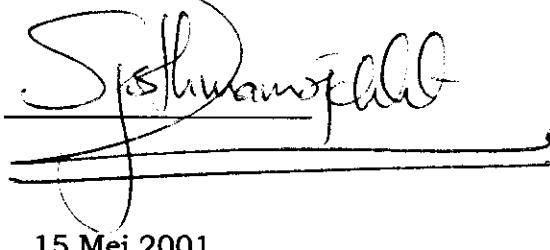
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ABSTRAK

Pelabuhan dan operasi kontena adalah salah satu asset yang terpenting bagi sesebuah negara kerana ia dapat mendatangkan pendapatan bagi membangunkan negara tersebut. Tambahan pula, ia dapat mengharumkan nama sesebuah negara di dunia kerana salah satu cara untuk menjalankan perdagangan di antara negara adalah melalui pelabuhan. Oleh itu, prestasi operasi kontena adalah sangat penting sebagaimana yang kita ketahui operasi kontena di pelabuhan adalah sangat kompleks and dinamik kerana setiap operasi memerlukan peralatan dan sumber yang berbeza. Oleh itu, kecekapan dalam mengagihkan dan utiliti peralatan serta sumber akan memainkan peranan yang besar dalam menentukan prestasi operasi kontena. Dalam kajian ini, simulasi dan model akan digunakan untuk menentukan and meningkatkan prestasi operasi di Westport, Klang kerana simulasi dan model adalah alatan yang paling sesuai serta baik untuk membuat kajian terhadap satu sistem yang kompleks dan dinamik. Tambahan pula, ia dapat mengurangkan kos kerana simulasi dan model membolehkan pengguna membuat eksperimentasi sebelum melaksanakan sebarang perubahan. Perisian simulasi yang digunakan dalam kajian ini dikenali sebagai “Arena Simulation Software”. Operasi kontena di Westport, Klang akan dimodelkan di dalam perisian ini. Model ini akan mengukur prestasi pelabuhan ini dari aspek utiliti dan kesibukan “Prime Mover” dan “Rubber Tyre Gantry” di kawasan “yard”. Tambahan lagi, model ini juga boleh dieksperimentasikan atau dipanggil “What-If” analisis supaya pengguna boleh membuat ujian terhadap model ini sebelum melaksanakan rancangan tersebut. Oleh itu, model ini dapat mengurangkan kos pelabuhan ini.

Katakunci : simulasi, model, operasi kontena, utiliti, kesibukan, prestasi, prime movers, Rubber Tyre Gantrys, perisian simulasi, “What-If” analisis

ABSTRACT

Seaports and container terminal operation is one of the most important assets for a country because it can contribute income to develop a country. Furthermore, it can help to make a country well known in a world because trading with other country through ports. The performance of the container terminal operation is very important. As we know that the container operation is a very complex and dynamic system. This is because each operation requires different resources and equipment assigned to it. Therefore the efficiency in the assigning and utilization of this equipment and resources will determine the performance of container terminal operation. In this research, simulation and modeling is used to study the performance of the container terminal operation in Westport, Klang because simulation and modeling is the best tool to study dynamic and complex operations. Furthermore, it will reduce the cost of the company because the users can use the simulation model to do some experimentation before real implementation. The simulation software, which is used in this study is called Arena Simulation Software. The container operation in Westport, Klang will be model in this software. This model will measure the performance of this port from the aspect of utilization and the busiest of the prime movers and Rubber Tyre Gantrys in the yard. Furthermore, this model can do a lot of experimentation or “What-If” analysis so that the users can test it before real implementation is done. Therefore, this model will reduced the cost of the company.

Keywords : simulation, modeling, container operation, utilization, performance, busiest, Prime Movers, Rubber Tyre Gantry, yard, What-If analysis

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CHAPTER 1

INTRODUCTION

1.1 Background

Seaports are considered as the link between seas to land transport, where goods from one place are transferred from one mode of transport to another. Ports are connected with ships, which bring import cargo, or load the export cargo on one side, and on the other side are linked by road or rail to move the cargo out, or bring in the cargo, as the case may be. A port is a very important asset for a country because it serves as the collection and distribution center for essential goods and cargo. Therefore, Malaysia is considered fortunate to have so many ports around it such as Kelang Port, Johor Port, Penang Port and et. al. Without efficient ports, Malaysia's will not able to compete with other countries. Malaysia once used to rely heavily on Port of Singapore for trading activities, hence, Malaysia have to bear a high cost to support this activities. One of the most important ports that play a very important role in Malaysia is Kelang Multi Terminal Sdn Bhd, also known as Westport.

The goal of this study is to develop a simulation model that can be used to help the port management to evaluate the performance of port operations. The major goal of terminal planning is to increase the terminal throughput, reducing handling time and turnaround time and increasing the utilization of facilities, minimize traffic congestion, utilize the resources required; and at the same time to be able to minimize the operating costs.

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